

## Original Article

# Designing a Comprehensive Evaluation Model for Health System Reform Plan in Iran: An Approach to Extended Balanced Scorecard

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## Abstract

**Background:** Health and striving to maintain and promote it has always been an important priority in governments, communities, and public policies. To implement health objectives through the Fifth Five-Year National Development Plan of Iran, the health system reform plan with three approaches to the financial protection of the public, creating equity in access to health services, and improving the quality of services has been on the government's agenda since 05.05.2014. Investigations revealed that the lack of a comprehensive and scientific model for evaluating this national program is evident. This study aimed to design a comprehensive model of health reform plan evaluation in Iran. What distinguishes this study from previous studies is the simultaneous attention to the challenges of performance evaluation, social responsibility, and examining them in a comprehensive and coherent model.

**Materials and Methods:** The present study considered as descriptive-survey research in terms of strategy. The research method was a combination that conducted from 2018 to 2019. The sample size of the qualitative part of the research consisted of 17 academic and executive health experts selected by purposive non-random sampling. In the quantitative part of the study, 400 health service providers selected by stratified random sampling. In this study, content analysis and Delphi technique, and Expert choice v24, SPSS V22 and AMOSV14 software were used to collect, classify, deduce and exploit data, and questionnaires.

**Results:** The findings of this study resulted in the design of a 900-scorecard model of the comprehensive evaluation of the health system reform plan in Iran based on 5 dimensions (finance, social responsibility, growth and learning, clients and internal processes), 17 components and 70 indicators.

**Conclusion:** The findings of the quantitative section of the study showed that the indicators, dimensions and levels of the comprehensive evaluation model for health system reform plan in Iran (CEHSRP-IR) qualified for evaluation of the effectiveness of this national program at different organizational levels and executing units of health system reform plan in Iran.

**Keywords:** Public policy, Health system reform plan, Performance evaluation, Effectiveness, Extended balanced scorecard, Delphi method, Content analysis

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## Introduction

Health and striving to maintain and enhance it is always an important priority in governments and communities. To implement health goals in the Fifth Five-Year National Development Plan of Iran, a health system reform plan with three approaches to the financial protection of the public, creating equity in access to health services, as well as enhancing the quality of services was on the government's agenda. On 03.30.2014 according to Note 21 of Iran's 2014 budget bill, part of the funding for this plan provided through the reform of the price of goods and services, and subsidies for bread, electricity and other goods and services, and was implemented on 2014/05/05<sup>1</sup>.

Evaluating performance and efficiency of the program as one of the factors affecting the effectiveness of health system reform plan (HSRP) can help policymakers and executives to better identify its strengths and weaknesses and strive to improve it<sup>2</sup>. Now, after about five years of plan implementation, the necessity of conducting scientific research with a precision tool to evaluate the plan implementation seems critical. The first step in this direction is design of a comprehensive evaluation model for HSRP in the country. This research seeks to fill the theoretical vacuum of the lack of a comprehensive model of health plan evaluation.

A review of conducted researches revealed that there was no holistic approach to evaluating the performance of this plan. Each of researchers involved in this field has addressed one aspect of the plan issues, and most research approaches have been in a simple framework (measuring clients' attitudes and practitioners of reform plans, etc.). This gap is such that the Deputy Minister of Health that is also in charge of implementing the plan has clearly and explicitly stated this need. He stated that measures and results of the implementation of the health reform plan should be evaluated in the language of statistics and based on internationally recognized indicators<sup>3</sup>. We aimed to address four major challenges in performance evaluation under these headings: lack of comprehensiveness of evaluation criteria at different levels, a one-dimensional

approach to evaluation and lack of comprehensiveness of evaluation dimensions, and lack of attention to social responsibility in the evaluation criteria and non-compliance of performance indicators and strategic goals<sup>4</sup>. In this regard and to cover part of this basic need to examine dozens of management models and evaluating performance and analysis experience of them. In accordance with the organizational structure of the country and the health system, and based on the opinion of the scientific and executive experts of this study, we concluded that using extended balanced scorecard and considering the local, climatic, cultural and structural conditions of this project (program). Utilizing the Wilcox theoretical framework, we design comprehensive evaluation model for HSRP in Iran. In this respect, the main purpose of this study was to design a comprehensive evaluation model of health system reform plan in Iran with the approach to extended balanced scorecard, so that the relevant organizations can use this model and implement their strategy and comprehensively evaluate the results.

In a study, Wu et al, conducted a balanced scorecard (BSC) based on a valid comprehensive accreditation system by surveying hospital staff in western China. In this study, they obtained valid responses from 216 professional staff through questionnaires. The results indicate that ranking the importance of the balanced scorecard's key points of view points to areas that are of great interest in future planning and management. This study recommends the creation of a balanced scorecard system for integrated care organizations in China<sup>5</sup>. Farooq Salman et al, also investigated the effectiveness of using the BSC as a management tool in evaluating performance and thus the quality of university services at Sohar University in Oman. The results of their research clearly showed that there was a strong relationship between the strategic roadmap and the four BSC perspectives. This study showed that the concept of BSC could be introduced to an educational institution to bridge the gap between strategy creation and implementation<sup>6</sup>.

In a study, Leksono et al. investigated the sustainable supply chain based on BSC and, using expert opinions, examined 29 extraction indicators and their effects on BSC dimensions and finally, by examining the relationships of indicators, designed the strategy map<sup>7</sup>.

Rahmat et al, in research, based on the extended balanced scorecard in the field of Indonesian manufacturing industries while addressing the environmental and social aspects of the scorecard, argue that environmental and social standards and resource productivity can help to prioritize the performance indicators and clarify the strategy map<sup>8</sup>. Gutacker and Street, in a study of the public sector treatment area in the United Kingdom entitled "Multidimensional performance assessment of public sector organizations using dominance criteria" argue that we need to find significant correlations between goals. They showed that ignoring the desired correlation can lead to inaccurate performance evaluation<sup>9</sup>.

Mehralian et al, in a study entitled "Total Quality Management (TQM) and organizational performance using the balanced scorecard approach at the Iranian pharmaceutical industry level" showed that TQM implementation could positively and significantly affect BSC and its four perspectives. They stated that given the strong relationship between TQM and all four organizational performance perspectives of BSCs, managers should strongly use TQM approaches to achieve their strategic goals<sup>10</sup>. Anjomshoae et al. in research entitled "Toward a dynamic balanced scorecard model for humanitarian relief organizations' performance management", by explaining the sustainable balanced scorecard, they provided a conceptual model with the BSC approach for humanitarian relief organizations<sup>11</sup>. Kailash and Jitesh in a study entitled "Development of the balanced scorecard for healthcare using interpretive structural modeling and analytic network process" to establish a balanced scorecard-based performance measurement framework for the healthcare system; identify key performance indicators and their relationship to the healthcare system. They used an integrated interpretive structural modeling approach and analytical networking process to develop a balanced scorecard<sup>12</sup>. Dadgar et al, in a study stated that the implementation of the above plan has resulted in a positive change in hospital performance indicators; therefore, in view of the continuous improvement of the current trend, continuity in the implementation of this plan recommended<sup>13</sup>.

In a study investigated the effect of subsidy targeting

and health reform plan on equity indicator in household health expenditures. Results showed that with regard to decreasing health financing after implementation of subsidy targeting law, it seems the incomplete implementation of the first phase of the subsidy targeting law had no positive effect on justice in the financing of the health system. On the other hand, with the implementation of the second phase of targeting subsidies, Paragraph B Article 5 of The 5th Five Year Development Plan and Health Reform Plan as a financial reform of the health system, no significant change in the inequality and injustice in the financing of the health system has been observed. Therefore, it seems that proper implementation of the laws, maximizing the protection of laws, timely financing and greater participation of the government in financing the health system are major contributors to the reduction of direct out-of-pocket payments and as a consequence of the reduction in income inequality that should be addressed in health care reform<sup>14</sup>.

In a study aimed at examining the performance of health insurance organizations in collaboration with the Ministry of Health and Medical Education in the effective implementation of the HSRP. Results of the analysis indicated the need for clarification and establishing legal requirements on the obligations of basic insurance organizations and subsequently, it is monitored and supervised by the health system trustee, the Ministry of Health<sup>2</sup>. In a study aimed at examining the importance of patients' satisfaction in health reform plan, the results showed that the level of attention that the health centers give to the patients' satisfaction was in relatively good condition; however, there was still a need for additional efforts to achieve the desired goal in the health system reform plan. It seems time to handle complaints and suggestions in the satisfaction survey forms used of the health reform plan needs to be substantially reviewed<sup>15</sup>. In a study aimed at analyzing key performance indicators in the field of human resources, the results indicated that key performance indicators are often used as a "value" and find it difficult to measure activities such as the extent to which leadership style was useful in organizational development, employment, service, and satisfaction. Key performance indicators are typically linked to the organization's strategy<sup>16</sup>.

In a study aimed at analyzing the selection of policy

interventions and decision-making of Iranian health system policymakers (1979-2014), and analyzing the thinking pattern of decision-making and policy-making. Results showed that the decision to implement at least one or important and widespread policy interventions taken from a life-long perspective was an important consideration during the tenure of the country's health system policymakers. According to this view, policymaking is based on contextual rational approaches, garbage-can model, and open decision-making and crisis decision-making methods. The health implications can also be justified by the patterns used<sup>17</sup>. In a study aimed at measuring how to implement the six-programs of health system reform plan from health care experts, the findings of this study revealed that the indicators evaluated concerning each program, although not 100%, were in relatively favorable condition. Given that evaluations took place at different times from the beginning of each program, this small amount of failure can be attributed to a number of reasons, such as inadequate training, lack of manpower, inadequacy of some infrastructures, such as increasing the number of patients referring to the centers, increasing the burden of problems for the health centers in the early stages of programs. Finally, it is recommended to re-evaluate the usefulness of these indicators in the second visit to the treatment centers compared to the results of the first visit<sup>18</sup>.

## Methods

The present study applied research in terms of purpose and considered as descriptive-survey research strategically. The research method was a combination that carried out during 2018-2019. The sample size of the qualitative part of the study consisted of 17 academic and executive health experts (selected by purposive non-random sampling). In the quantitative part of the study, 400 health service providers (selected by stratified random sampling) was the sample size. In the study, content analysis and Delphi technique and Expert Choice v24, SPSS V22, and AMOSV14 software were used to collect, classify, deduce and exploit data and questionnaires. Studying previous research records and upstream documents, relatively

comprehensive knowledge of how to fully evaluate the health system reform plan in Iran obtained. Then a preliminary framework was provided on this basis. As the researches in this field showed, the comprehensive evaluation of the HSRP in Iran has many varied domains and levels of analysis. For this reason, the quantitative approach to this research may cause neglect some factors, because constructing theoretical frameworks in the quantitative approach that underlies hypotheses puts research in formats that lack the flexibility to deal with new situations. Besides, given the fundamental importance of context in the comprehensive evaluation of the health system reform plan in Iran, the research subject should be thoroughly reviewed based on Iran's status and data. Therefore, investigating and finding a comprehensive evaluation model of health system reform plan in Iran was carried out by a mixed approach (qualitative and quantitative), in which there was no predetermined framework such as theory or model, and the framework presented was based on a study of literature and data collected by the Delphi technique and content analysis method.

In the qualitative phase, data were extracted and consented using targeted sampling and interviews and semi-structured questions. The Delphi method in 4 consecutive periods including 17 indices, and 70 indices, the comprehensive evaluation of health system reform plan in 5 dimensions and at 4 levels are done. Expert selection criteria also included theoretical mastery, practical experience, willingness, and ability to participate in research and access<sup>19</sup>. In the Delphi study, if the participants were homogeneous, 10 to 15 samples would be sufficient to perform Delphi. A review of the studies and articles that have chosen Delphi methodology shows that the number of experts suggested between 10 and 12 samples<sup>19</sup>. Thus, in this study, about 50 health and health management experts were identified, and after filtering and applying the mentioned indicators, the list of 18 individuals was obtained. It should be noted that in the first round of the Delphi method, 17 people participated, and 15 questionnaires were returned and usable. There were 15 in the second round and 14 in the third and fourth rounds. Then, using paired comparisons and SPSS software and Expert Choice, weights of dimensions and indicators and priorities extracted from the Delphi method were identified. In the quantitative phase, in

order to fit the designed model and confirm its capability and comprehensiveness, using stratified random sampling method, the views of 400 health service providers of health reform plan in 10 educational and non-educational hospitals were extracted through a questionnaire derived from the CEHSRP-IR model, obtained at Shahid Beheshti University of Medical Sciences.

## Results

**A) Identification and extraction of dimensions and levels of the CEHSRP-IR model:** After careful study of the strategic documents of the country health map, issued policies, upstream regulations, structures governing the health executive system of Iran, and analyzing more than 50 management and performance evaluation models, findings using content analysis were classified, coded, analyzed, and exploited. Based on the findings of this phase of the study, the research experts reached consensus on the following topics considered the model framework:

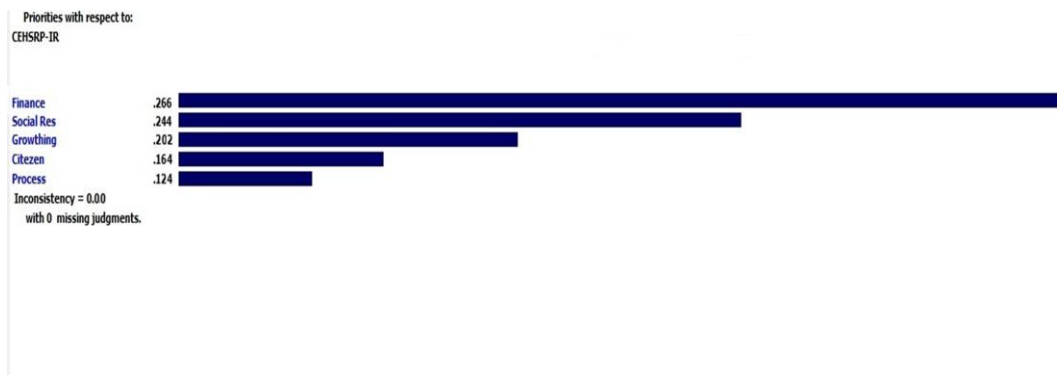
1. The most appropriate template for designing this research model, due to its comprehensiveness and applicability, was the balanced scorecard, which has five dimensions: finance, internal processes, social responsibilities, citizens and clients, growth and learning.
2. To address all levels of the plan, four levels of policymakers, strategic managers, resource providers, health service providers, and clients were defined and selected for comprehensive evaluation.

**B) Identification and determination of the dimensions, components and indicators of the CEHSRP-IR model:** In the Delphi process, the first interviews and questions were either unstructured or open-ended questions, which served as the strategy

**Table 1:** Identification and Prioritization of Main Dimensions of the CEHSRP-IR Model.

Dimensions (areas)	Mean Value	Weight	Prioritization
Finance	3.948	0.266	1
Social responsibility	3.920	0.244	2
Growth and learning	3.979	0.202	3
Citizens and clients	3.891	0.164	4
Internal process	3.686	0.124	5

for generating ideas, intending to reveal all the issues related to the subject under study. Each expert was asked to personally make a brainstorm, to freely express any ideas and opinions on a comprehensive evaluation of the health system reform plan in Iran, and to briefly return anonymous lists of desired topics. At this stage, there was no need for the ideas to be fully developed, and no attempt was made to evaluate or judge the views. All relevant responses were collected as far as possible, as the rest of the steps are based on the first step. At this stage, the subject of comprehensive evaluation of the health system reform plan in Iran, its dimensions and aspects was studied, and various questions were asked based on the Delphi panel. Then, the responses were organized, similar ideas were combined, grouped and duplicate themes were removed, and with the help of experts, a list of important components and metrics extracted and analyzed in a comprehensive evaluation of the health system reform plan in Iran. The list included five general dimensions, each of which had components and indicators at four levels.



**Figure 1.** Prioritization of the main dimensions of the model.

**Table 2:** Identification and Weight of Components of the CEHSRP-IR Model.

Model Dimensions	Components of Each Dimension	Component Weight
Finance	Optimize income structure, costs and productivity-based investment of service levels	0.056
	Intelligent and targeted monitoring of the supply, distribution and consumption of equipment, pharmaceuticals and medical supplies	0.108
	Funding of the plan from public government funds and charitable budgets commensurate with progress and effectiveness	0.102
Social responsibility	Establishment of the system and mechanism of participation of all groups involved in the project in order to implement, monitor the plan	0.090
	Full development of services including health insurance and services in all parts of the country and social classes	0.083
	Commitment of sovereign bodies to fully implement the plan and pay attention to the fundamental rights of the people	0.071
Growth and learning	Using health data in line with research goals and unraveling the country's health problems	0.083
	Comprehensive knowledge management at all plan levels	0.032
	Expanding creativity, innovation and technology in the health area	0.048
Citizens and clients	Reform of education system based on country health map	0.049
	Access to accountability at all levels of the plan to public opinion and build transparency platforms	0.046
	Maximum satisfaction of project clients	0.070
Internal process	Improving community health and disease management	0.048
	Removing annoying interface chains in service path and delegating staff power to the plan levels	0.076
	Attracting inter- and intra-organizational institutions and organizations at international, regional, national and local levels	0.018
	Develop standard protocols, validation and service development	0.036
	Utilization of intelligent systems in structural modification, process and performance at all plan levels	0.022

The dimensions of the study, which adapted from the developed balanced scorecard model, were as follows: finance area, social responsibility area, citizenship and client area, internal process area, growth and learning area<sup>20</sup>. The levels of study that are going to evaluate the health transformation plan in Iran at these levels and from the perspective of these levels are macro-level (policymakers and managers), mid-level (resource providers), micro-level (health service providers), and general level of service (clients).

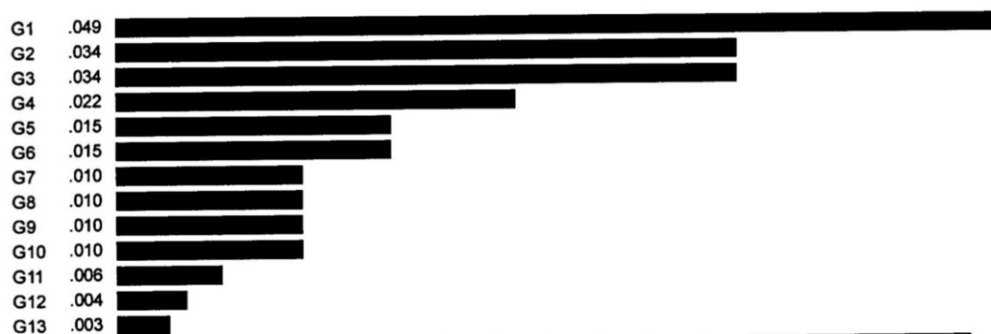
In each Delphi round, the panelists' opinions were sorted by mean and standard deviation and continued until consensus was reached. In each round, the indicators with an average of less than 3 were eliminated (scores ranging have been from 0 to 6). Factors influencing comprehensive evaluation of health system reform plan in Iran were selected in five dimensions (areas) including: finance area (including 2 macro-level indicators, 6 mid-level

indicators, 4 macro-level indicators and 3 general level indicators. Totally 15 indicators), social responsibility area (including 5 indicators at macro level, 3 indicators at mid-level, 3 indicators at micro level and 6 indicators at general level of service; totally 17 indicators), citizens and clients area (including 1 macro-level indicator, 2 mid-level indicators, 4 micro-level and 5 general level of service indicators; 12 indicators in total), internal process area (including 4 indicators at macro level, 2 indicators at mid-level, 5 indicators at micro level and 2 indicators at general level; 13 indicators in total), and growth and learning area (including 4 indicators at macro level, 2 indicators at mid-level, 6 macro-level indicators and 1 general-level indicator ;13 in total). The mean and standard deviation of the total indicators in the fourth round was calculated to be 3.844 and 0.823, respectively. Comparison of mean values and standard deviation of all indicators in the fourth round, with similar values in the second round, shows that the

**Table 3:** Prioritization of indicators of growth and learning.

Indicators	Indicator Code	Mean	Weight	Indicator Ranking
Per capita educational growth of personnel and health service provider in the reform plan	G1	4.617	0.049	1
Conducting research educational needs assessment	G2	4.489	0.034	2
Improving the level of skills of staff and health service provider in the health reform plan	G3	4.419	0.034	3
Up-to-date training provided to service teams	G4	4.349	0.022	4
Establish and strengthen research groups to analyze and exploit health system data for optimal resource management, knowledge development, and...	G5	4.31	0.015	5
Use of family physician at the first level of community care	G6	3.956	0.015	6
Development of self-care education services of the Ministry of Health to the community	G7	3.897	0.010	7
Establishment and development of creativity and innovation units in different health sectors	G8	3.877	0.010	8
Development and promotion of health information technology system in health reform plan	G9	3.867	0.010	9
Use of information technology capacities in health education and research	G10	3.791	0.010	10
Development of referral system at different levels of health care in reform plan	G11	3.701	0.006	11
Paying attention to rooting and solving scientific and logical problems in the path of implementation of health system reform plan	G12	3.407	0.004	12
Changing the educational system of medical, paramedical, health and other departments based on the country's health system reform plan	G13	3.333	0.003	13

Synthesis with respect to: CEHSRP-IR(EFFECTIVENESS OF HEALTH REFERM PLAN)



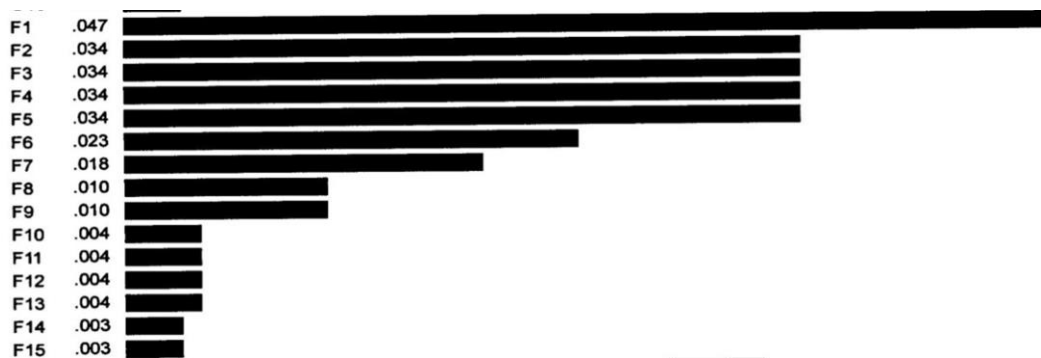
**Figure 2.** Prioritization of growth and learning model indicators.

indicators had higher mean and lower standard deviation compared to the second round, but there was no tangible change compared to the third round. Typically, in the Delphi method after completing and revising the questionnaire several times, the model and tool were finalized, and the researcher assures the scientific validity of the conceptual model and its dimensions, components, and indicators. In this

study, the Delphi method was completed after the fourth round of Delphi based on consensus criteria. However, another criterion has been applied to the consensus of experts, was Kendall coefficient of concordance or consensus scale. Kendall coefficient of coordination was calculated for panel members' responses to the 5-dimensional indicators of the model, 0.735 for the second round, 0.893 for the third

**Table 4:** Prioritization of Finance Area Indicators.

Indicators	Indicator Code	Mean	Weight	Indicator Ranking
Deployment and optimization of pay based on staff performance of the project	F1	4.679	0.047	1
Detailed and structured monitoring of the prices of medical equipment / medicines / supplies used	F2	4.568	0.034	2
Providing free health care services to vulnerable groups, covered by support organizations, accident and...	F3	4.524	0.034	3
Resource / revenue growth of health care centers compared to the previous year	F4	4.465	0.034	4
Per capita promotion costs of training of staff working on health system reform plan	F5	4.382	0.034	5
Maintaining long-term financial commitments between hospitals / health centers involved in the plan and resource providers (insurers, drug companies, equipment, etc.)	F6	4.111	0.023	6
Approval and allocation of appropriate funds of health system reform plan for all levels of plan services	F7	4.102	0.018	7
Reducing the share of people paying for health care costs	F8	3.837	0.010	8
Ratio of capital expenditure to current expenditure (high ratio)	F9	3.836	0.010	9
Reduce unnecessary patient costs	F10	3.546	0.004	10
Public access to insurance	F11	3.538	0.004	11
Suitable support for development and facilitation in attracting public assistance	F12	3.531	0.004	12
Reduction of the percentage of hospital deductions	F13	3.385	0.004	13
Optimizing health financial management systems	F14	3.365	0.003	14
Reduce direct payments from patients 'and other clients' pockets	F15	3.359	0.003	15



**Figure 3.** Prioritization of growth and learning model indicators.

round, and 0.903 for the fourth round. Given that, the panel had more than 4 members (15 for the second round, 15 for the third round, and 14 for the fourth round); Therefore, this value of the Kendall coefficient is quite significant. Since the Kendall coefficient of coordination in the fourth round increased by only 0.01 compared to the third round,

and since the consensus of the members in the two consecutive rounds does not show significant growth, it is, therefore, possible to end the repetition of the



**Table 5:** Prioritization of Social Responsibility Indicators.

Indicators	Indicator Code	Mean	Weight	Indicator Ranking
Creating motivational mechanisms and engaging health care providers of health reform plan in health care delivery	S1	4.539	0.032	1
Involvement of health sector stakeholders in formulating policies and decisions for health system reform plan	S2	4.263	0.024	2
Integration and convergence of policymakers and decision makers in health reform plan	S3	4.242	0.024	3
Access to health care for all members of the community and target groups	S4	4.121	0.024	4
Increasing honesty in service delivery	S5	4.089	0.016	5
Easy and effective access to social support during care (social work, counseling, etc.)	S6	4.087	0.016	6
Direct and mutual access of patients and clients of the plan to the health team (especially the physician)	S7	4.039	0.016	7
Clarify financial mechanisms for plan clients	S8	4.035	0.016	8
Supervision of sovereign apparatus (Parliament, Ministry of Health, etc.) on expenditures and income in health reform plan	S9	4.033	0.016	9
Easy access of vulnerable groups (the elderly, the poor, etc.) to health system reform plan services	S10	3.972	0.016	10
Commitment of sovereign apparatus (Parliament, Ministry of Health, etc.) on preventing and fighting corruption in the health reform plan	S11	3.868	0.010	11
Accountability and transparency at all levels of the health reform plan	S12	3.789	0.010	12
Non-discrimination in the participation of all stakeholders in the formulation and protection of health reform plan laws	S13	3.747	0.006	13
Commitment of sovereign apparatus (Parliament, Ministry of Health and The Ministry of Cooperatives, Labor, and Social Welfare) to provide public insurance coverage in health reform plan	S14	3.649	0.006	14
Confidentiality of patients' information and clients of plan	S15	3.649	0.006	15
Increasing accuracy and reduced medical error / health team	S16	3.444	0.004	16
Ministry of Health monitoring the quality of health, treatment, and social services provided to the community	S17	3.097	0.002	17



**Figure 4.** Prioritization of Social Responsibility Model Indicators.

Delphi rounds. On the other hand, Kendall coefficient of coordination values indicate that there is a strong consensus in the second round, but in the third and fourth rounds, there is a strong consensus among the panelists. The dimensions, components,

and indicators extracted in this model were shown in tables and figures 1 to 7:

**A) Dimensions:** Initially 5 determined dimensions are prioritized based on average values, geometric mean and weight (extracted from Expert Choice software) in

the final model that the results are presented in Table 1 and Figure 1:

**B) Components:** The comprehensive model for evaluating the HSRP in Iran, consisting of 17 components as shown in Table 2:

**Indicators:**

and weight of the indicators (extracted from Expert Choice software), prioritization of finance indicators is presented in Table 4 and Figure 3.

**Social Responsibility:** Based on the mean values, geometric mean and weight of the indicators (extracted from Expert Choice software), prioritization

**Table 6:** Prioritization of Citizen and Client Area Indicators.

Indicators	Indicator Code	Mean	Weight	Indicator Ranking
Establishing a patient complaint record system for errors in the Ministry of Health System	C1	4.565	0.035	1
Negative growth in mortality rates in the population covered by the plan	C2	4.461	0.035	2
Increasing the level of citizens' access to health system reform plan	C3	4.412	0.011	3
The rate of realization of the electronic health record for the people	C4	3.897	0.010	4
Increase patient / clients' satisfaction with the quality of health services received	C5	3.864	0.006	5
Appropriate access to performance monitoring and process control of project resource supply chains for all target groups including citizens, clients and healthcare staff	C6	3.736	0.006	6
Public access to accreditation indicators for public and private health centers	C7	3.719	0.006	7
Continuous and effective supervision of supervisory units on compliance with patient rights in health care units of health system reform plan	C8	3.707	0.006	8
A reduction in the number of patients to physicians	C9	3.682	0.006	9
Increasing the proportion of plan clients to the population covered	C10	3.625	0.006	10
Increasing patient / clients' satisfaction of plan discharge time (decreasing patient discharge / service termination process	C11	3.514	0.004	11
Increasing patient / clients' satisfaction with staff performance	C12	3.512	0.004	12



**Figure 5.** Prioritization of Citizen and Client Model Indicators.

**Growth and learning:** Based on the mean values, geometric mean and weight of the indicators (extracted from Expert Choice software), prioritization of growth and learning indicators according to Table 3 and Figure 2 is presented.

**Finance:** Based on the mean values, geometric mean

of indicators of social responsibility is presented in Table 5 and Figure 4.

**Citizen and clients:** Based on the mean values, geometric mean and weight of the indicators (extracted from Expert Choice software), prioritization of citizen and client area indicators is presented Table

6 and Figure 5.

**Internal process:** Based on the mean values, geometric mean and weight of the indicators

(extracted from Expert Choice software), prioritization of indicators of the area of the internal process is presented in Table 7 and Figure 6.

**Table 7:** Prioritization of Indicators of Internal Processes.

Indicators	Indicator Code	Mean	Weight	Indicator Ranking
Providing performance feedback system and modify processes and structures	P1	4.226	0.024	1
Using the self-assessment system for staff	P2	3.925	0.012	2
Promoting culture of acceptance of change	P3	3.854	0.012	3
Removing / reducing service intermediary chains (insurance, equipment, medicine, etc.) in order to honor and facilitate services	P4	3.805	0.010	4
Development and implementation of standard care protocols in health system reform plan	P5	3788	0.010	5
Validation and resource allocation based on the ratings of the various health-oriented	P6	3.715	0.009	6
Extending inter-departmental cooperation between the Ministry of Health and other government departments to achieve the plan's goals	P7	3.674	0.008	7
Engaging other sectors of government in health policy making	P8	3.657	0.008	8
Determining the role and duties of other sectors of government in promoting community health by the Ministry of Health	P9	3.608	0.008	9
Developing a teamwork culture	P10	3.585	0.007	10
Reducing patient / clients' waiting time in health system reform plan	P11	3.435	0.006	11
Reducing service processes	P12	3.233	0.005	12
Transferring responsibility and authority of the Ministry of Health by maintaining management and supervisory control over local units (governorate, municipality, provincial councils, NGOs, etc.)	P13	3.192	0.005	13



**Figure 6.** Prioritization of Internal Processes Model Indicators.

**C) Validity, Reliability and Model Fitting:** After designing the model in the qualitative part of the research, a questionnaire based on 70 extracted indicators was prepared and after validity the questionnaire was administered to 30 experts in the field of management and health, and then they were asked to give their opinion in the form of three "Necessary", "Useful but not necessary" , and "Not necessary" answers. Then, the CVR value was calculated. The measured CVR value is 0.46 since the minimum CVR value for the expert community of 30 is 0.33, the value obtained is higher than the

standard value, so it can be concluded that the questionnaire designed in this study has the necessary content validity and can properly evaluate the purpose of this study. Its reliability was calculated and confirmed by Cronbach's alpha test (financial area 0.832, social responsibility area 0.835, citizen and client area 0.917, internal process area 0.811, growth and learning area 0.788). Then, using the questionnaire, the opinions of 400 staff of SBMU about the designed model were ,extracted from Cochran formula, obtained from staff of 10 educational hospitals (Imam Hossein, Loghman,

**Table 8:** The Results of Reliability and Sampling Adequacy Test.

<b>Case Processing Summary</b>			
		N	%
Cases	Valid	400	100.0
	Excluded <sup>a</sup>	0	.0
	Total	400	100.0
<b>Reliability Statistics</b>			
Cronbach's			
	Alpha	N of Items	
	.976	70	
<b>KMO and Bartlett's Test</b>			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.908
Bartlett's Test of Sphericity	Approx. Chi-Square	2157.980	
	df	1302	
	Sig.	.000	

Modarres, Taleghani, Shohadaye Tajrish) and non-educational hospitals (Firouzkouh Imam Khomeini, Sevvom Shaaban Damavand, Shohadaye Gomnam, Zaim Pakdasht, Shohadaye Pakdasht). Then, factor analysis tests were used to evaluate the fit of the model. According to the results of the tests presented in Table 8 and confirmatory factor analysis test statistics, it can be claimed that the designed model of this study has the potential to be used and evaluate the health reform plan effectively in Iran.

In this study, the KMO statistic is 0.908, so the sample size is sufficient for factor analysis. Bartlett's test value also shows that Normed Chi-square (the degrees of freedom divided by x) is less than 2 and is confirmed. According to the results of these tests, the confirmatory factor test was performed using AMOS software, in which the results are as follows:

$$X^2=2157.980 \quad df =1302$$

$$x^2/df=1.657 \quad rmsea=0.41$$

The results of the fit indices obtained from confirmatory factor analysis indicate the fitness of CEHSRP- IR model.

## Discussion

In general, after identifying, prioritizing, and confirming the indicators of a comprehensive

evaluation model for health system reform plan in Iran, its conceptual model is shown in Figure7. According to the experts' opinion of this study, the CEHSRP-IR evaluation model is introduced. It is possible to evaluate the health reform plan across all health service providers involved in the plan using this model. It is recommended that researchers and supervisory authorities use it to evaluate relevant areas while developing this model.

According to experts' opinion and statistical population, the benefits of the proposed model are indicators; balancing, paying attention to the social responsibility dimension, the high separation power and flexibility of the model designed through the extracted indicators, score-based, weights of indicators with regard to all key aspects of model performance, and high validation of model, which confirmed the validity of used model. Providing the opportunity to evaluate the health system reform plan based on the comprehensive scientific model in comparison with other similar health service provider organizations, determining the path of reform and improvement of indicators based on the scientific results of the performance evaluation, the achievement of strategic objectives, optimization of resources in the expected outputs, and achieving balance are among the other features and benefits of this study. It is hoped that the

results of this study will be used by other researchers.

improvement of indicators based on the scientific



Figure 7. Comprehensive Evaluation Model for Health System Reform Plan in Iran (CEHSRP-IR).

## Conclusion

According to experts' opinion and statistical population, the benefits of the proposed model are indicators; balancing, paying attention to the social responsibility dimension, the high separation power and flexibility of the model designed through the extracted indicators, score-based, weights of indicators with regard to all key aspects of model performance, and high validation of model, which confirmed the validity of used model. Providing the opportunity to evaluate the health system reform plan based on the comprehensive scientific model in comparison with other similar health service provider organizations, determining the path of reform and

results of the performance evaluation, the achievement of strategic objectives, optimization of resources in the expected outputs, and achieving balance are among the other features and benefits of this study. It is hoped that the results of this study will be used by other researchers.

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